Comprehensive VOC Investigation Work Plan

Village of Lisle, Illinois

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1.0 INTRODUCTION

The purpose of this Comprehensive Volatile Organic Compound (VOC) Investigation Work Plan (Work Plan) is to identify certain tasks necessary to delineate the nature and extent of the TCE contamination that has been detected in the groundwater from releases at the Lockformer Company facility located at 711 West Ogden Avenue, Lisle, Illinois (Site).

Previous subsurface investigations have been conducted at the Site and have identified concentrations of VOCs in the groundwater exceeding the Class I Groundwater Remediation Objectives (GROs) established in Title 35 of the Illinois Administrative Code, Part 742, *Tiered Approach to Cleanup Objectives* (TACO). Class I GROs were selected as the measure for comparison in that they are the most conservative objectives established in TACO and do not require the use of restrictions to achieve conditions that are protective of human health and the environment, as determined by the Illinois Pollution Control Board (IPCB).

This Work Plan presents the framework for further soil and groundwater investigation designed to supplement the results from previous investigations. The Work Plan includes the installation of 20 groundwater monitoring wells, located both on and off the Site, to facilitate the collection of groundwater samples. Groundwater information will be collected and interpreted in an attempt to determine the extent and character of the VOCs in the groundwater in the vicinity near the Site. Further soil investigations will be conducted to better define the extent of soil contamination in the vicinity of the former outdoor TCE storage tank, and to determine the occurrence of contamination by other potential source areas in the vicinity of the facility building.

The completion and submittal of this Work Plan is intended to satisfy the requirement established in item #10 of the Agreed Order for Immediate and Preliminary Injunction with Defendant Lockformer, entered on January 22, 2001 (Appendix A).

2.0 SITE DESCRIPTION

The Site is located in south-central DuPage County, Illinois (Figure 1). The Site consists of an east and west parcel that encompasses a total of 18.5 acres (Figure 2). The east parcel consists of approximately 6.54 acres and is occupied by a single structure with associated landscaped and drive/parking areas. The structure is utilized by Lockformer as a manufacturing facility for production of sheet metal processing equipment and roll forming machines. The west parcel consists of approximately 11.96 acres of undeveloped land. The Site is located in a mixed area of industrial, commercial, and residential use, approximately 1,300 to 1,800 feet west of Interstate 355.

The Site is bounded to the north by Ogden Avenue, beyond which exists a residential subdivision; to the east by new construction (future Bill Kay car dealership); to the south by a surface water retention basin servicing the Bill Kay property (beyond which exists single-family homes) and the Burlington Northern railroad (beyond which exists St. Joseph's Creek); and to the west by a multi-unit commercial building.

2.1 TOPOGRAPHY

Clayton obtained and reviewed a topographical survey for the vicinity of the Site from DuPage County. The topographical information for the Site is illustrated in Figure 3. In general, the Site's west parcel is higher in elevation than the east parcel. However, both parcels appear to slope to the south/southwest. The eastern portion of the east parcel slopes east. A lower lying (ditch) right-of-way is located at the western edge of the east parcel and the eastern edge of the west parcel. Elevations on the east parcel appear to range from approximately 714 feet above mean sea level (msl) adjacent to Ogden Avenue to approximately 700 feet above msl at the most southwestern portion of the parcel. Elevations on the west parcel range from approximately 714 feet above msl adjacent to

Ogden Avenue to approximately 684 feet above msl at the southern portion of the parcel.

2.2 GEOLOGY

The Site is located within the Wheaton Morainal section of the Great Lakes physiographic province. Based on the *ISGS Circular 460 (Summary of the Geology of the Chicago Area - 1971)*, the uppermost surficial glacial deposits present at the Site consist of undifferentiated Valparaiso Moraine deposits. The Valparaiso Moraine includes a buried drift of questionable age, informally called the Lemont Drift, which consists of yellow-gray silty till; sand and gravel; and dune sand. The deposits are generally overlain by a thin Richland Loess or modern soil *(Illinois State Water Survey/Ground Water Resources of DuPage County, Illinois - Cooperative Ground Water Report 2 - 1962).*

Based on the *ISGS Circular 532 (Potential for Contamination of Shallow Aquifers in Illinois-1984)*, the Site borders upon Cahokia Alluvium depicted as Ax deposits and/or C1 depicted deposits. The Cahokia Alluvium consists of unconsolidated, poorly sorted sand; silt; or clay containing local deposits of sandy gravel. These modern deposits are generally found in floodplains of streams and rivers. The thickness of the alluvium is variable and may directly overlie Silurian Age bedrock consisting primarily of dolomite. C1 deposits consist of greater than 20 feet of glacial till (mainly pebbles and cobbles in a clay, silt, and sand matrix, deposited directly by glacial meltwater) and other fine-grained material of the Wisconsinan Glacial Stage. A thin layer of loess (windblown silt) and modern soil, ranging in thickness from 0 to 2 feet, may mantle the glacial deposits in this area.

The Paleozoic bedrock underlying the glacial deposits consists of about 3,500 feet of consolidated, stratified, sedimentary rocks of Cambrian; Ordovician; and Silurian ages. The formations dip gradually to the east and southeast at about 10 feet per mile and are

folded into a series of gentle anticlines and synclines. The glacial deposits at the subject property rest upon a synclinal fold of Silurian-aged bedrock of the Niagaran Series. The Niagaran rocks range from clean dolomite to highly silty, argillaceous, and cherty dolomite with some thin shale beds and may contain reefs locally *(Illinois State Water Survey / Ground Water Resources of DuPage County, Illinois - Cooperative Ground Water Report 2 - 1962).*

Based on subsurface investigations previously conducted at the Site, the lithologies underlying the Site typically consist of cohesive, silty clay glacial till and fill from surface grade to an elevation of approximately 680 to 690 feet above msl. The silty clay is underlain by glaciofluvial sand and gravel containing variable amounts of silt and clay. This glaciofluvial deposit can be distinguished readily by its high percentage of carbonate, sand, and gravel clasts. It is typically very poorly sorted, and grades to finer-grained sand and silt toward the base of the deposit at some locations. The elevation of the base of this glaciofluvial sand and gravel is highly variable across the Site. Groundwater variably saturates the base of this glaciofluvial deposit across the Site to form a water table condition.

Cohesive, silty clay glacial till that exhibits an irregular surface underlies the glaciofluvial deposit over most of the Site's investigation area. The irregular nature of this till surface appears to influence the occurrence and migration of groundwater in the glaciofluvial sediments. Previous work at the Site suggests that at two locations within the study area, this lower glacial till deposit does not exist, and the coarse-grained glaciofluvial deposits are in direct contact with the bedrock surface below.

Niagaran Series dolomite bedrock of Silurian period age underlies the glacial till and/or glaciofluvial deposits at the Site. The dolomitic bedrock occurrence has not been

extensively characterized at the Site, but was encountered between 635 and 640 feet msl in three locations.

2.3 HYDROGEOLOGY

Based on the *Cooperative Ground Water Report 2*, the character and origin of the deposit, stratigraphic position, water-bearing properties, and use, six principal geohydrologic units have been recognized in the geological material beneath DuPage County. From top to bottom, they are as follows:

- Glacial drift aquifers
- Silurian dolomitic aquifer
- Confining beds of the Maquoketa Formation
- Cambrian-Ordovician aquifer
- Confining beds of the Eau Claire Formation
- Mt. Simon aquifer

Together, the glacial drift aquifers and Silurian dolomite comprise the upper aquifer system in the region. This system is hydraulically separated from the lower aquifer systems by confining beds of the Maquoketa Formation (shale). The glacial drift aquifers are the saturated, relatively clean, coarse-textured, glaciofluvial deposits of sand and gravel that occur erratically throughout the glacial drift. The occurrence of glacial drift aquifers is extremely irregular, and their character and distribution range widely.

The Silurian dolomite aquifer is made up of the rocks of the Niagaran and Alexandrian Series of Silurian age that lie directly beneath the glacial drift. Groundwater in the Silurian dolomite aquifer is stored within fractures and bedding planes in the dolomite, and moves through a complex network of interconnected openings. Most of the openings in the dolomite are secondary in origin and were formed after the deposition and consolidation of the rocks. The upper part of the dolomite aquifer is generally a zone of

high permeability and a major water-yielding zone that is usually the most productive part of the aquifer.

Based on the previous subsurface investigations conducted at the Site, the first occurrence of groundwater appears to primarily exist within the glaciofluvial sediments at the Site.

2.4 PREVIOUS SUBSURFACE SITE INVESTIGATIONS

Impacted soil was first discovered in the fall of 1991, during underground utility (water line) repair work conducted at the west side of the Site building. The largest source of the impacts is believed to have occurred from various small-volume releases of TCE during the refilling of the roof-mounted TCE tank formerly located at the Site. The tank was located on the roof of the west side of the building and was equipped with a metal fill pipe that extended down the west building wall to approximately 4 feet above grade. The fill pipe led to a plastic 55-gallon drum that was also located at grade.

Beginning in 1992, a series of subsurface investigations were conducted at the Site to evaluate the extent of VOC contamination. The investigations included the advancement of 82 soil borings to facilitate the collection of discrete soil samples, and the installation of 30 monitoring wells to facilitate the collection of groundwater samples for chemical analysis. Monitoring well locations at the Site are illustrated in Figure 4.

Laboratory analytical results identified VOC concentrations exceeding TACO Class I GROs in select groundwater samples collected at the Site. A summary of analytical results for groundwater samples collected at the Site is presented in Table 1. Based on the groundwater investigation results to date, the extent of the groundwater at the Site containing concentrations of VOCs exceeding TACO Class I GROs has not been completely defined.

3.0 SCOPE OF WORK

The scope of work associated with this Work Plan includes the installation of 20 groundwater monitoring wells; collection and laboratory analysis of groundwater samples for the presence of VOC and select geochemical characterization parameters; further source area investigation; investigations to determine the existence of other source areas; a bedrock fracture characterization analysis; and the performance of a pump test utilizing the Site's production well.

3.1 MONITORING WELL INSTALLATION

Eighteen monitoring wells will be installed as nine sets of monitoring well clusters. Each well cluster will consist of two monitoring wells; one well completed in the water-bearing glaciofluvial sediments and an adjacent monitoring well completed in a water-bearing zone within the Silurian dolomite bedrock. The nine groundwater monitoring well clusters will be installed in what is expected to be generally hydraulically downgradient locations from the source area of TCE contamination. The remaining two individual wells will be completed in the water-bearing Silurian dolomite bedrock in what is expected to be upgradient locations.

During the drilling of all monitoring wells soils will be sampled continuously, logged by a geologist, and screened by a photoionization detector (PID) for the presence of VOCs. At each soil boring location where PID readings exceed background, the samples will be retained and the samples exhibiting the highest PID reading will be submitted for laboratory VOC analysis. Work to date has indicated that this background trigger value is 5 ppm. Those samples exceeding this value will be submitted for laboratory analysis.

3.1.2 Monitoring Well Locations

Nine monitoring well clusters will be installed south and southwest of the Site's current investigation area to identify the presence of VOCs in groundwater within the glaciofluvial sediments and Silurian dolomite bedrock.

One bedrock well will be installed in the north portion of the Site and one in the northeast portion of the Site to investigate the presence of VOCs in the groundwater within the bedrock at those locations, and to provide better indication of groundwater flow within the dolomite. Proposed monitoring well locations are illustrated in Figure 4.

3.1.3 Monitoring Well Installation Procedures

Well installation activities in each of the investigation areas will be performed using roto-sonic drilling techniques that provide continuous core sampling from surface grade to competent bedrock. Competent bedrock is defined as the acquisition of a bedrock core greater than one-foot in thickness that does not contain greater than a one-inch deposit of clay, silt or sand. Upon reaching competent bedrock, a permanent steel casing will be installed through the roto-sonic casing and grouted in place. The surface casing will facilitate the installation of the bedrock well at a later time. This initial boring will define the sequence of lithologies above bedrock at that location and facilitate the proper installation of the glaciofluvial well installation in the cluster.

In locations proposed as well clusters, an adjacent monitoring well will be installed in the unconsolidated glaciofluvial material using roto-sonic or auger techniques. If coarse-grained, unconsolidated glaciofluvial sediments are present at that location immediately above bedrock, the well screen will be installed in the upper, weathered surface of the bedrock and lower saturated glaciofluvial sediments. If it is determined that fine-grained,

cohesive sediments are immediately above bedrock, the well screen will be installed at the base of the saturated, glaciofluvial sediments immediately above this fine-grained deposit.

Following a minimum 48-hour period to allow the permanent steel surface casing to set, each bedrock location will be cored to completion depth. All the bedrock wells will be completed 25 feet into the bedrock with the exception of two locations in the south central portion of the Site that will be completed 80 feet into the bedrock. The location of the bedrock well installations and their completion depths are illustrated in Figure 4. Each bedrock location will initially be cored to completion depth by either a rotary or roto-sonic technique. After completion of the bedrock core, it may be necessary to ream out the core hole at some locations to facilitate later monitoring well construction.

Each of the nine bedrock well cluster locations will undergo packer testing. The packer tests will either take place during drilling with a single packer to isolate approximately the bottom ten-feet of the borehole, or after drilling with a double packer to isolate approximately ten feet of the borehole at a time. In each instance, the submersible pump in the packer will be used to evacuate two borehole volumes of the packed section prior to a VOC sample being acquired for chemical analysis. These samples will be submitted for analysis on a 24-hour turn around basis. The results of these packer test VOC analyses will dictate the final completion depth for monitoring well materials to be installed at each location.

A more detailed discussion of the glaciofluvial monitoring well and bedrock monitoring well installation procedures is provided in Sections 3.1.3.1 and 3.1.3.2, below.

3.1.3.1 Glaciofluvial Monitoring Wells

The installation of nine glaciofluvial groundwater monitoring wells is anticipated for the south and west perimeter of the investigation area. The installation of the wells will be facilitated using a roto-sonic or auger drill rig. Upon reaching the final completion depth, a monitoring well will be installed through the roto-sonic casing. Monitoring wells will be constructed using flush threaded 2-inch ID stainless steel, 0.010-inch machine-slotted screen; and 2-inch ID stainless steel riser. No adhesives, solvents, or grease will be used. The top of the riser for monitoring wells will be situated above grade and will be secured with an expandable locking cap with a hole drilled through its center.

Mounted wells will be completed at the asphalt surface on the Northern Builders property.

Based on previous subsurface investigations conducted at the Site, there are two different situations likely to occur within the saturated glaciofluvial sediments. Each of these lithologic variations will result in a unique well construction method. One situation consists of saturated glaciofluvial sand and gravel sediments directly overlying bedrock. In this situation, the hollow stem augers will be advanced through the weathered, upper bedrock surface to competent bedrock; and the well will be installed. The 10-foot well screen in this situation will be completed adjacent to the weathered bedrock surface and lower, saturated glaciofluvial sediments.

The second situation that may present itself consists of saturated, glaciofluvial sand and gravel, overlying cohesive silty clay till; which, in turn, overlies Silurian dolomite bedrock. In this situation, the hollow stem augers will be advanced approximately one foot into the till, and the well will be installed. The resulting well screen completion

will entirely intercept groundwater derived from the saturated glaciofluvial sediments only.

A sand filter pack will be installed adjacent to the screen via tremie line and will extend to a height of approximately 2 feet above the upper screen interval. A minimum 2-foot bentonite pellet seal will be placed over the sand filter pack, and the annular seal will be hydrated with tap water. A bentonite/grout mix will be placed above the bentonite pellets to within 5 feet bgs. The auger string will be raised incrementally during placement of the sand pack, annular seal, and grout. A locking protective casing will be installed over the monitoring wells and set in concrete. The remaining annular space will be filled with concrete to secure the protective locking cover and form a concrete pad at grade. A typical glaciofluvial monitoring well construction plan is illustrated in Figure 5.

3.1.3.2 Bedrock Monitoring Wells

The installation of 11 bedrock groundwater monitoring wells is anticipated for the investigation area. Each bedrock monitoring well will have a steel surface casing installed through the glacial drift overlying bedrock, prior to any bedrock drilling taking place. The steel surface casing will be set into competent bedrock, grouted into place, and allowed to set for a minimum of 48 hours prior to drilling out from the surface casing.

During roto-sonic drilling, a steel casing is advanced along with the continuous core barrel. Upon reaching competent bedrock, a 6-inch ID steel casing will be installed through the roto-sonic drilling casing. The surface casing installed in the borehole will extend from the competent bedrock surface to above surface grade. A neat cement/bentonite grout will be placed around the steel casing, as the roto-sonic casing string is removed from the hole. The roto-sonic casing string will be raised incrementally

during placement of the grout to maintain the appropriate hydraulic head within the casing.

Following a minimum 48-hour period to allow the grout to set, drilling out from the surface casing will be performed utilizing air rotary or roto-sonic techniques. Each hole will be cored either 25 feet or 80 feet into the competent rock depending on the location. The bedrock cores will be collected using typical NX core sampling equipment (or similar), PQ core sampling equipment (if roto-sonic) and air rotary techniques (when necessary). The bedrock cores will be analyzed in detail and logged for reporting purposes. The rock core will be marked, labeled, and placed in wooden core boxes to preserve the exact nature of the retrieved core to the extent practicable. Clayton will keep the rock cores in a safe location to allow subsequent review and analysis. Drilling breaks will be noted and correlated with the core fracture analysis, and rock quality designations (RQDs) will be logged. The use of air drilling techniques will allow the identification of water yielding zones. The zones identified as water yielding during drilling will likewise be correlated with the rock core retrieved.

Upon reaching the completion depth in the rock via coring techniques, where necessary, a $5^{7}/_{8}$-inch, tri-cone, air rotary bit will be used to ream the entire depth of the corehole. Upon completion of the reaming, packer testing, and acquisition of the packer test analytical results, a monitoring well will be installed into the borehole. Monitoring wells will be constructed using 10-foot sections of flushed threaded 2-inch ID stainless steel, 0.010-inch machine-slotted screen; and 2-inch ID stainless steel riser. No adhesives, solvents, or grease will be used. The top of the riser for monitoring wells will be situated above grade and will be secured with an expandable locking cap with a vent hole installed.

A sand filter pack will be placed via tremie line techniques to a height of approximately 2 feet above the upper screen interval. A minimum 2-foot bentonite pellet seal will be placed over the sand filter pack, and the annular seal will be hydrated with tap water. A neat cement/bentonite grout will be placed above the bentonite pellets to surface grade. A typical double-cased monitoring well construction plan is illustrated in Figure 6.

Drilling spoils generated during the installation of the monitoring wells will be managed as identified in Section 3.5.2.

3.1.4 Monitoring Well Development Procedures

For bedrock wells, where it was necessary to ream the corehole with a rotary bit, the initial well development will take place prior to well construction materials being installed in the borehole. Prior to well installation, each rotary bit hole that was reamed will be surged by the air of the drill rig to use the naturally produced formational groundwater to clean the borehole wall. This procedure will continue until reasonably clear water is surged from the hole.

After a minimum of 48 hours following installation, the monitoring wells will be developed using a new disposable bailer and/or electrical submersible pump. Prior to development, the static water level and the total depth at each well will be measured using an electronic water level indicator. The measurements will be referenced to a marked survey location on the rim of the well riser. The two measurements will be used to calculate the volume of standing water in each well (well volume). Monitoring well development will be performed by surging and purging using a bailer and/or electrical submersible pump. Surging of the monitoring wells will be accomplished by dropping a solid slug into the well and then moving the slug up and down through the screen interval. A minimum of ten well volumes of water from each well will be removed or, if

there is insufficient water, the well(s) will be bailed/pumped dry at least five times. Turbidity of the development water will be monitored throughout the development process. Development will be complete upon removal of the 10 well volumes (or bailed dry 5 times).

If necessary, additional water may be removed in order to further reduce turbidity. Groundwater removed from monitoring wells will be managed as identified in Section 3.5.3.

3.2 GROUNDWATER SAMPLING PROCEDURES

Prior to water sample collection, a minimum of three casing/filter pack volumes of water will be removed from each of the newly installed monitoring wells until temperature, pH, and conductivity have stabilized for three consecutive readings, or the well has been purged dry. The stabilization criteria will be as follows:

- temperature: $\pm$ 0.5 °C
- pH: $\pm$ 0.1 unit
- conductivity: $\pm$ 15%

Purging will be conducted using a submersible pump or bladder pump. All groundwater samples will be acquired by bladder pump. Groundwater samples for laboratory analyses will be collected in laboratory-supplied containers, labeled, and properly sealed. The sample labels will include sample number, place of collection, date and time of collection, and analyses to be performed. The samples will be delivered under proper chain of custody protocol to an independent laboratory for analyses.

Groundwater removed from monitoring wells will be managed, as identified in Section 3.5.3.

3.2.1 QA/QC Samples

QA/QC samples will be collected and analyzed in conjunction with the investigative samples. The types of QA/QC samples and their frequencies are described below.

3.2.1.1 Trip Blank

A trip blank is a water sample prepared by the laboratory that is transported to the sampling Site and is handled in the same manner as other samples, except that it remains unopened, and then is returned to the laboratory for analysis to determine QA/QC of sample handling procedures. One trip blank is included in each cooler containing groundwater samples for VOC analysis.

3.2.1.2 Field Duplicate

A field duplicate is a blind duplicate sample taken in the field and sent to the laboratory for analysis. The results will provide some indication of the homogeneity of the sample medium and the precision of the laboratory and its equipment. A minimum of one field duplicate will be collected for each ten or fewer organic samples of groundwater.

3.2.1.3 MS/MSD

A MS/MSD is a separate sample or additional sample volume (the samples will be split at the laboratory to provide the MS duplicate) collected in the field and sent to the laboratory for analysis. The results provide information about the effect of sample matrix on the digestion and measurement methodology. MS/MSDs will be collected for each 20 or fewer organic groundwater samples. MS/MSDs will not be obtained at the same locations as duplicates.

3.3 GROUNDWATER ANALYSIS

Groundwater samples will be analyzed for the presence of the following list of indicator parameters:

Constituent	Analysis Method
VOCs	SW8260b
Ethene/Ethane	SW8260b (modified) or similar
Oxidation-Reduction Potential	In-field meter utilizing a flow through cell
Dissolved oxygen	In-field meter utilizing a flow through cell
Iron (filtered)	SW6010A or colorimetric Hach 8146
Manganese (filtered)	SW6010A
Sulfate	In-field Hach 8051
Sulfide	In-field Hach 2100
Nitrate	IC method E300
Chlorides	In-field Hach 8-P, IC E300, or SW9050
Total Organic Carbon	SW9060
Chemical Oxygen Demand	SM 5220 A-D

3.4 MONITORING WELL SURVEY

After installation, monitoring wells will be surveyed by a licensed surveyor for both horizontal and vertical control. Survey points for each well will include a predetermined

location on the rim of the well riser and a reference ground elevation immediately adjacent to the well.

3.5 MANAGEMENT OF INVESTIGATION-DERIVED MATERIALS

Investigation-derived materials will be generated during multiple phases of the groundwater investigation activities, including: equipment decontamination, monitoring well installation, well developing/purging, and groundwater sampling. The management of such materials is discussed in the Sections 3.5.2 and 3.5.3.

3.5.1 Equipment Decontamination

The decontamination area for drilling/well installation equipment will be established at the Site. The area will be constructed in a manner that will allow the collection of all decontamination materials. A high-pressure power washer supplied with potable water will be used for decontamination of truck-mounted drilling equipment. Prior to entering the Site, all appropriate parts of truck-mounted drilling equipment will be thoroughly washed with a standard commercial soap and clean water to remove soil, oil, and grease. Before initiating drilling activities and between each location, the appropriate parts of the equipment (including split spoons, augers, drill bits, drill rods, core barrels, casings, and any associated tools that enter boreholes) will be high-pressure washed at the decontamination station.

Sampling equipment such as downhole pumps, split spoons, bailers, and scoops that will be reused during sampling will be decontaminated between each sampling location or interval (if applicable). This decontamination protocol consists of scrubbing the equipment with an Alconox or comparable solution and tap water wash followed by a distilled water rinse.

Mud and surficial soils removed during the equipment decontamination process will be managed with investigation-derived soils as described in Section 3.5.2. Decontamination water will be managed as outlined in Section 3.5.3.

3.5.2 Management of Investigation-Derived Soils

Soil cuttings brought to the surface during drilling activities will be containerized and staged on-Site. All containers will be labeled as to their contents and date of origin, pending management off-Site.

3.5.3 Management of Investigation-Derived Liquids

Decontamination water and groundwater generated during development or purging of monitoring wells will be containerized and staged on-Site. All containers will be labeled as to their contents and date of origin, pending management off-Site.

3.6 BEDROCK FRACTURE CHARACTERISTICS ANALYSIS

Clayton recommends that any field work that would further characterize fracturing in the Silurian Dolomite, over and above the analysis that is already planned as part of the monitoring well installation, be deferred until after the planned 20 monitoring wells are installed and sampled. The primary reason for this recommendation is that the scope of any further fracture characterization of the Silurian dolomite will be better planned after the data from the rock cores and groundwater sampling of the bedrock monitoring wells is in hand. The need to do this work may even be obviated altogether, depending on the data acquired from the monitoring well installations. For instance, rock coring may indicate a very regular thinly bedded formation with little to no secondary fracturing; and the groundwater analysis from the monitoring wells may indicate elevated, highly

predictable concentrations of constituents that form a broad plume shape downgradient from the source area. This data could suggest that constituents of concern are migrating through bedding planes within the dolomite and are assuming a reasonably consistent plume configuration. In this instance, further fracture analysis of the bedrock would not be merited and resources would be better spent on further characterization of the groundwater extent of contamination and determination of aquifer hydraulic characteristics.

Clayton will provide a recommendation for any further bedrock fracture characterization in the VOC investigation report that is due seven days after the completion of the VOC investigation activities outlined in this work plan.

3.7 PUMP TEST

No well logs are available for the current production well on the Lockformer property. The presence of previous wells at the Site has not been confirmed, and no information exists regarding the construction of such wells. Clayton is currently pursuing the available large-scale, historical, aerial photographic coverage for the Site to determine the historical use of the property. If a well is identified, it may be necessary to use geophysical techniques (electromagnetic conductivity and/or a magnetometer) to investigate the area where the residential well was likely to have been. Anomalies identified by the geophysical techniques may need to be investigated with surface excavation to determine if the well casing from a previous well still exists on the property.

Based on the aerial photography and geophysical investigation to locate the former private well onsite, Clayton will use the data collected during the monitoring well investigation to outline the procedures to perform the pump test utilizing the Lockformer

production well. The pump test procedures will be outlined in the VOC investigation report that is due seven days after the completion of the VOC investigation activities outlined in this Work Plan.

3.8 BUILDING SUBSURFACE INVESTIGATION

Lockformer has previously investigated storm and sanitary sewer lines and their bedding material outside of the building footprint. Lockformer has also performed some investigation around the degreaser inside the building. These investigative efforts were reported in the Interim Investigation Report for the Lockformer Site (January 25, 2001, Clayton Group Services, Inc.). Lockformer will perform additional characterization efforts to determine the horizontal and vertical extent of soil contamination by performing additional borings within the building footprint and in the vicinity of building doorways. After these additional soil boring investigations are complete, the installation of additional groundwater monitoring wells may be necessary to define the extent of contamination around these respective areas of the facility.

3.8.1 Sewer System Investigation

Figure 7 presents an as-built diagram of the Lockformer facility building and illustrates the location and construction of storm and sanitary sewer piping, and floor drains within the building. All the sewer piping in the building is made of cast iron. A review of the video camera survey, performed in 1994, of the sewer system indicates that the cast iron pipe is installed in six-foot joints.

The main header line for both the storm and the sanitary sewer system runs east to west, just north of the vapor degreaser. The header exits from under the building on the west side and it enters into a concrete block where it transitions to vitrified pipe. Figure 16

from the January 25, 2001 Interim Investigation Report indicates the location of sewer piping outside the building.

The main east-west header piping has laterals running north and south at regular intervals throughout the building. On the sanitary system, these laterals typically lead to floor drains. The exceptions to this are:

- Plumbing vent stacks.
- Plumbing to the restroom, adjacent to the double truck dock.
- Plumbing to the degreaser pit that receives water from the vapor chiller and distillation unit. This line is sealed and would not allow flow from the degreaser pit.

The storm sewer system services downspouts from roof drains. One exception to this occurs in the double truck dock at the north end of the building. The truck dock has a sump at its southeast corner that is connected to the storm sewer system.

Investigations into potential releases from the sewer system under the Lockformer building will be initiated by performing 15 borings under the floor in operations areas as shown in Figure 7. The borings are arranged along the sewer system to evaluate sections of the sewer upstream of each location; and thereby, isolate any contamination identified to be coming from that specific section of the sewer system. Any contamination problem associated with a particular section of the sewer system could then be further investigated effectively. Fourteen of the fifteen borings are located to assess specific sections of the sanitary sewer, since it services the floor drains within the facility. The storm sewer primarily services the roof drains, with the exception of the storm sewer sump in the southeast corner of the double truck dock. One boring will be located by this sump to assess any potential contamination.

At each of the sewer boring locations, the facility concrete flooring will be cored and removed to allow access to the subsurface soils for sampling. Sampling will be performed by a hydraulic probe unit (HPU). Soil samples will be screened with a photoionization detector (PID). At each soil boring location, the boring will be advanced to a depth of at least 15 feet. All samples exhibiting a sample bag headspace screening PID reading greater than 20 ppm will be submitted for laboratory analysis (the 20 ppm PID value is based on experience in performing other similar investigation efforts and from work performed thus far on the Lockformer Site). In the instance that no samples are determined to exhibit a sample bag headspace screening PID concentration of greater than 20 ppm, the sample indicating the highest PID reading from the boring will be submitted for laboratory analysis. All soil samples will be preserved by method 5035. To the extent practicable at each location, if water is encountered within the bedding materials around the sewer pipe a sample will be collected for analysis.

At any boring where elevated PID readings are still being encountered at a depth of 15 feet, drilling will continue until the vertical extent of the soil contamination is defined or the practical limit of the HPU drilling technology is encountered. In the event that the practical limit of the HPU drilling technology is encountered, other drilling techniques will need to be considered.

3.8.2 Vapor Degreaser Investigation

Soils around the vapor degreaser will be investigated through sampling directly adjacent to the degreaser; and then, stepping out 10 feet away from the original sampling locations and sampling again. Further sampling will continue in this fashion until the vertical and lateral limits of contamination around the degreaser are defined. The initial soil sampling locations around the degreaser are identified in Figure 7.

At each of the degreaser boring locations, the facility concrete flooring will be cored and removed to allow access to the subsurface soils for sampling. Sampling will be performed by a hydraulic probe unit (HPU). Soil samples will be screened, selected for analysis and conducted in every other manner consistent with that discussed in Section 3.8.1. All soil samples will be preserved by method 5035.

At any boring where elevated PID readings are still being encountered at a depth of 15 feet, drilling will continue until the vertical extent of the soil contamination is defined or the practical limit of the HPU drilling technology is encountered. In the event that the practical limit of the HPU drilling technology is encountered, other drilling techniques will need to be considered.

3.8.3 South Entrance Door Investigation

There is only one pedestrian entrance/exit doorway to the operations portion of the Lockformer facility, other than the entrance/exit doorway by the TCE tank source area on the west side of the building. This doorway is located on the south side of the building just east of the heat treatment unit within the building. The doorway and the initial sampling locations around it are shown in Figure 7.

Sampling around the doorway will be performed by a hydraulic probe unit (HPU). Soil samples will be screened, selected for analysis and conducted in every other manner consistent with that discussed in Section 3.8.1. All soil samples will be preserved by method 5035.

At any boring where elevated PID readings are still being encountered at a depth of 15 feet, drilling will continue until the vertical extent of the soil contamination is defined or the practical limit of the HPU drilling technology is encountered. In the event that the

practical limit of the HPU drilling technology is encountered, other drilling techniques will need to be considered.

3.9 FURTHER TCE TANK SOURCE AREA INVESTIGATION

The locations for previous borings performed by STS and Carlson were not surveyed by a registered surveyor. Clayton is in the process of having all known boring locations surveyed. It has recently been determined that several of the STS and Carlson boring locations, in close proximity to the TCE tank source area, were erroneously depicted on the insert box of Figure 4 in the January 25, 2001 Interim Investigation Report. The most important of the borings in this area have been located correctly and appear approximately correct (pending survey by the registered surveyor) in Figure 8.

Figure 8 also depicts other key soil borings around the TCE tank source area that define the extent of contamination. Soil borings (from north to south) SB-605, SB-606, SB-607, SB-608, and MW-101 currently define the extent of contamination in soil around the TCE tank source area down to approximately 25 mg/kg. Lockformer acknowledges that the soils within the insert box, in Figure 4 in the January 25, 2001 Interim Investigation Report, will need to be considered during remedial action at the Site. Lockformer recommends that further investigation efforts be focused on defining the level of soil contamination between the immediate area around the TCE tank fill line and the 600-series borings. The location of borings to implement this investigation is identified in Figure 8.

Currently, it is anticipated that coarse-grained sediments in the vicinity of the TCE tank source area will be remediated through use of vapor extraction. The results of the proposed further investigative efforts will likely guide the nature of remediation efforts used on the cohesive, fine-grained subsurface sediments. These general presumptive

remedy assumptions have been considered in developing the sampling plan outlined below for this area.

Sampling around the TCE tank source area will be performed by a roto-sonic method. Soil samples will be screened continuously with a photoionization detector (PID). At each soil boring location the boring will be advanced to the lower basal till below the coarse-grained, glaciofluvial outwash deposit. A sample of the upper portion of this basal till will be acquired for laboratory analysis at each location. It is anticipated that the basal till will be encountered at a depth of approximately 50 to 55 feet in this area.

Other borings previously drilled in the area of the TCE tank indicate that the upper 30 feet of subsurface will consist of cohesive, silty clay fill and glacial till lithologies. The soil sample exhibiting the highest headspace PID reading from each ten foot interval while drilling through this unit will be submitted for laboratory analysis. This will result in three soil samples from the upper silty clay fill and glacial till being analyzed at each boring location. Once the coarse-grained glaciofluvial sediments are encountered they will be screened to determine the most elevated headspace PID value. This sample will be submitted for laboratory analysis. Upon encountering the basal till below the glaciofluvial sediments, the upper surface sample of the till will be collected for laboratory analysis. This sampling methodology will result in five samples being submitted for laboratory analyses from each boring during this investigation. All soil analyses will be preserved by method 5035.

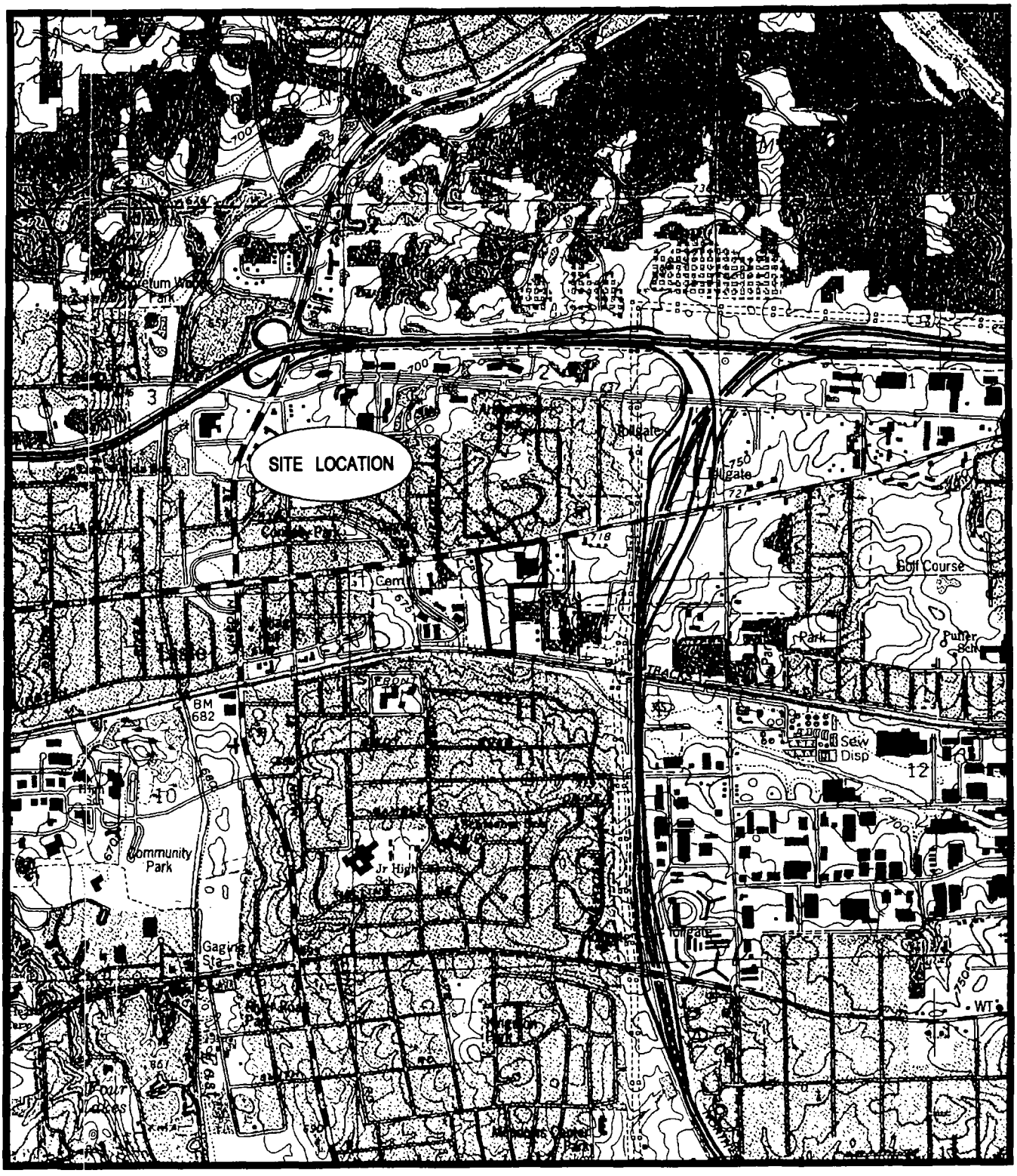
4.0 TIMELINE

Investigation activities associated with this Work Plan will be initiated within 14 days of its approval by the Illinois Environmental Protection Agency (IEPA). Figure 9 presents a timeline for conducting the scope of work outlined in this work plan.

A report discussing the results of the investigation efforts described by this Work Plan will be submitted to IEPA within seven days of receiving the validated analytical data from the soil and groundwater sampling efforts. The report will summarize the field activities and will be presented in accordance with the format indicated in 35 IAC Part 740, Sections 740.430 and 740.435. The results of these most recent investigation efforts will be used to make interpretations and will be incorporated into figures, tables and appendices for the report.

Lockformer recognizes that additional work may be required beyond the scope described by this work plan, and will revise the work plan and field efforts appropriately in conjunction with discussions regarding potential additional work with IEPA.

FIGURES



Scale 1:24000

0 1/2 1 MILE

1000 0 1000 2000 3000 FEET

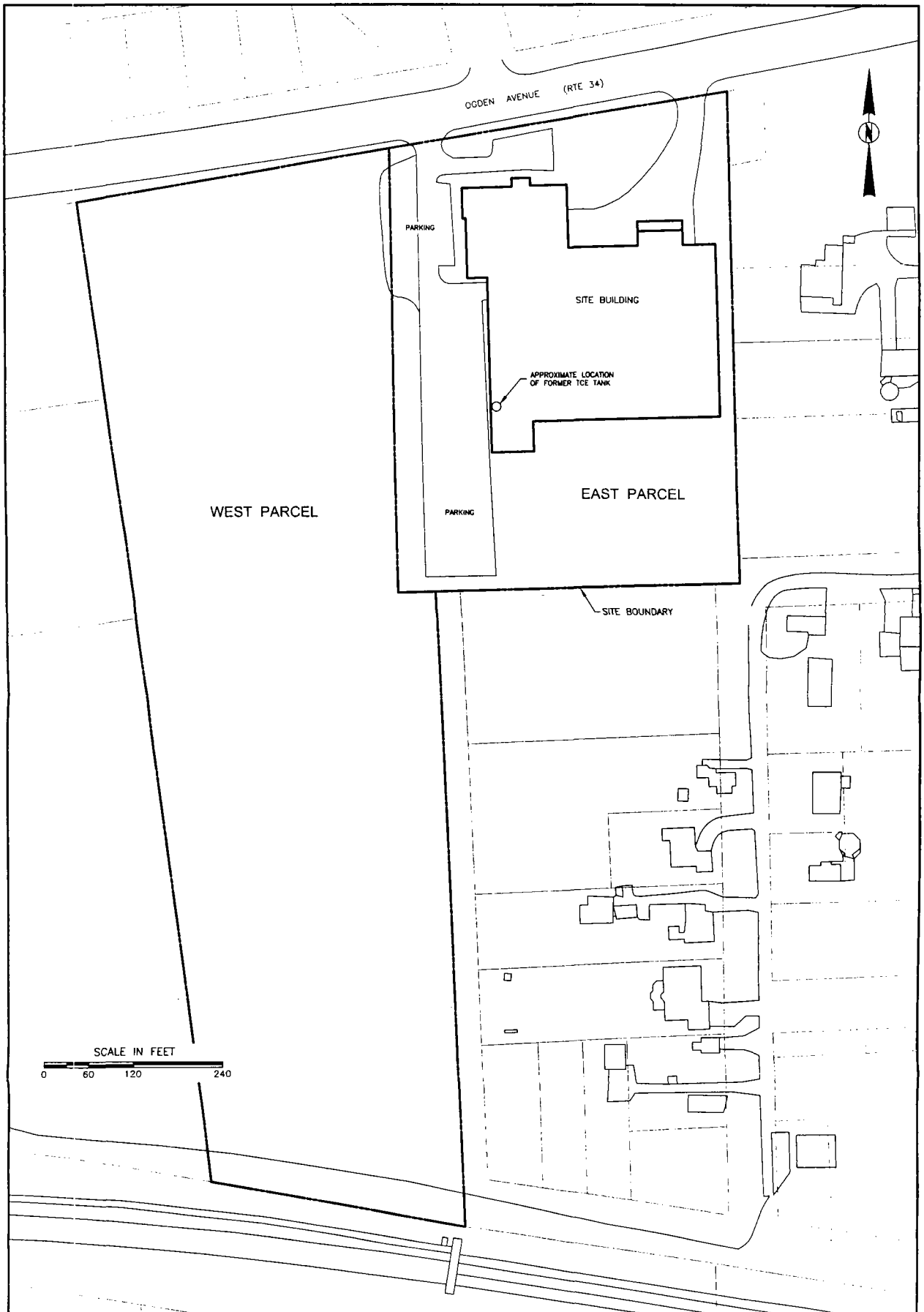
QUADRANGLE LOCATION

FIGURE 1

SITE LOCATION MAP

THE LOCKFORMER COMPANY
711 OGDEN AVENUE
LISLE, ILLINOIS

(SOURCE OF MAP IS USGS 7.5 MINUTE QUADRANGLE MAP, WHEATON, ILLINOIS)



CHECK BY	
DRAWN BY	BCP
DATE	2-2-01
SCALE	AS SHOWN
CAD NO.	5526301K
PRJ NO.	55263.01

SITE LAYOUT MAP

THE LOCKFORMER COMPANY
711 OGDEN AVENUE
LISLE, ILLINOIS

Clayton GROUP SERVICES
3140 FINLEY ROAD, DOWNERS GROVE, IL 60515

FIGURE 2

300 0 300 600 Feet

LEGEND

PARCEL BOUNDARY

TOPOGRAPHIC CONTOUR LINE

SITE TOPOGRAPHIC MAP

N

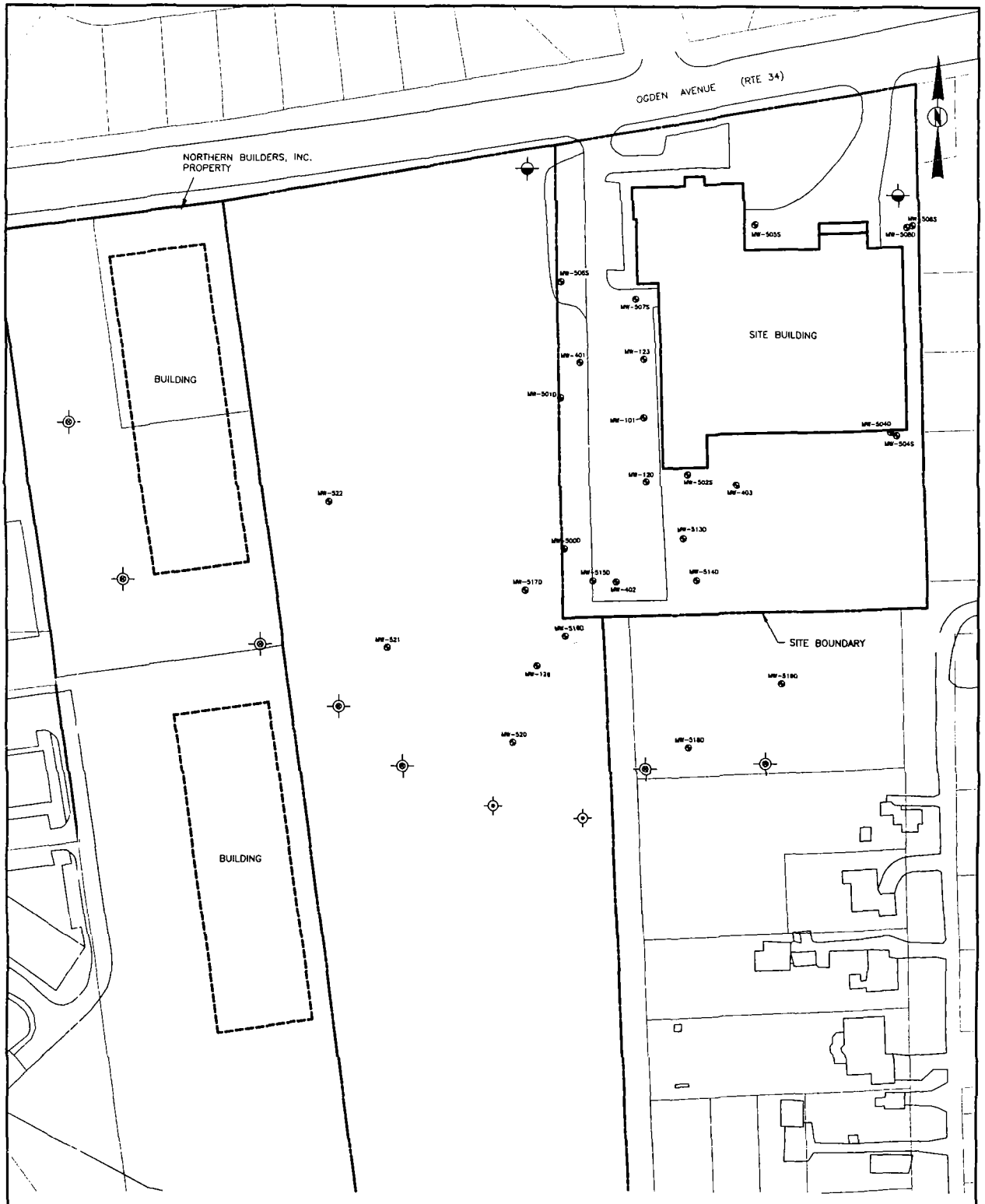
NOTE:

Aerial Photo, Property Boundaries, and Contour Lines obtained from DuPage County Government
Date of Aerial Photo: April 1998

Map is Illinois State Plane East, NAD 83, Foot

LOCKFORMER, INC.
711 OGDEN AVENUE
LISLE, ILLINOIS

FIGURE 3



LEGEND

- EXISTING MONITORING WELL
- PROPOSED BEDROCK WELL ONLY
- PROPOSED WELL NEST LOCATIONS TO BE VERIFIED IN FIELD (BOTH GLACIOFLUVIAL AND BEDROCK WELL w/25-FOOT BEDROCK OPEN HOLE).
- PROPOSED WELL NEST LOCATIONS TO BE VERIFIED IN FIELD (BOTH GLACIOFLUVIAL AND BEDROCK WELL w/80-FOOT BEDROCK OPEN HOLE)

SCALE IN FEET

0 60 120 240

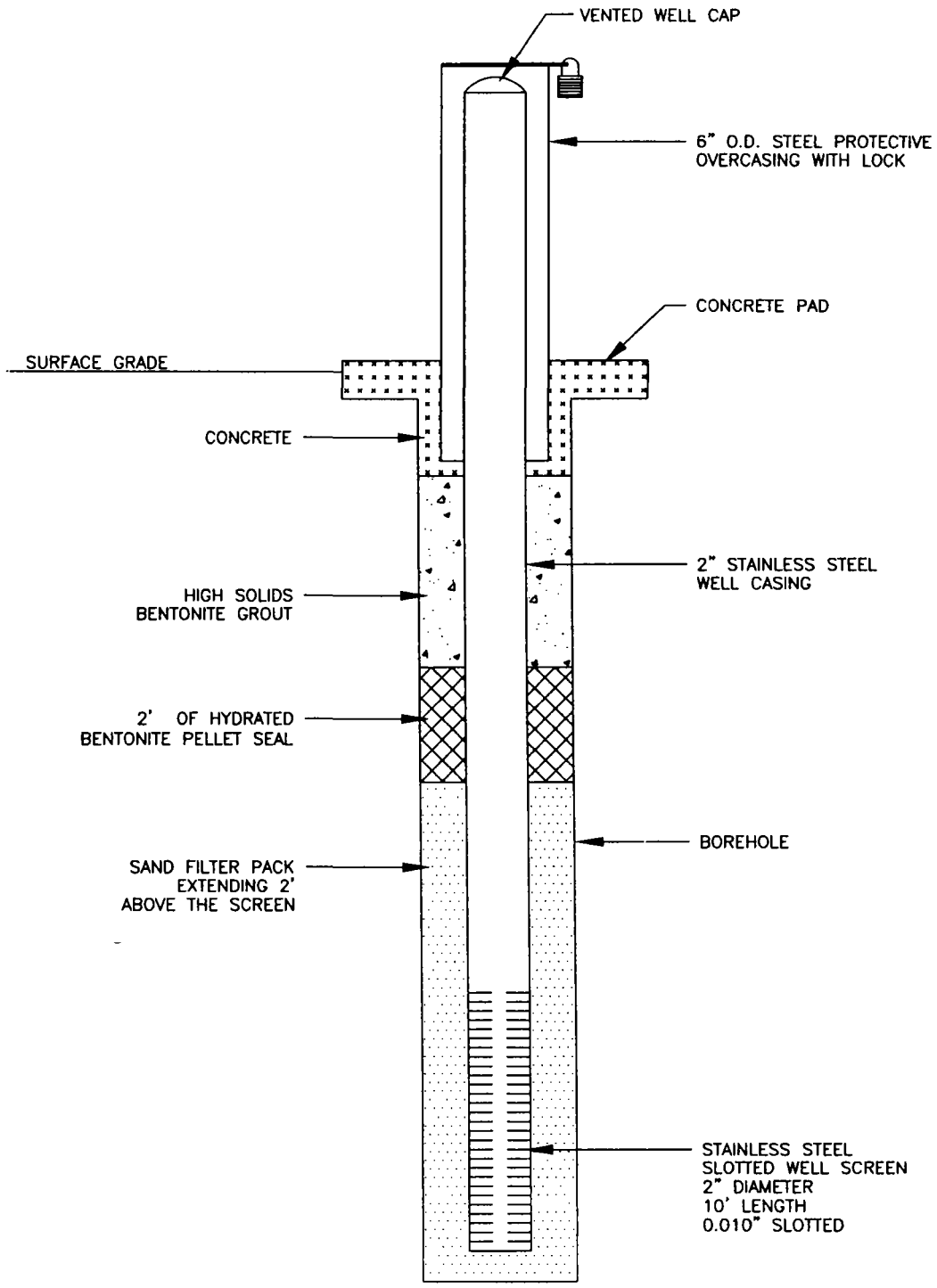
CHECK BY	
DRAWN BY	BCP/HA
DATE	3-23-01
SCALE	AS SHOWN
CAD NO.	6526301J
PRJ NO.	65263.01

MONITORING WELL LOCATION MAP

THE LOCKFORMER COMPANY
711 OGDEN AVENUE
LISLE, ILLINOIS

Clayton GROUP SERVICES
3140 FINLEY ROAD, DOWNERS GROVE, IL 60515

FIGURE 4



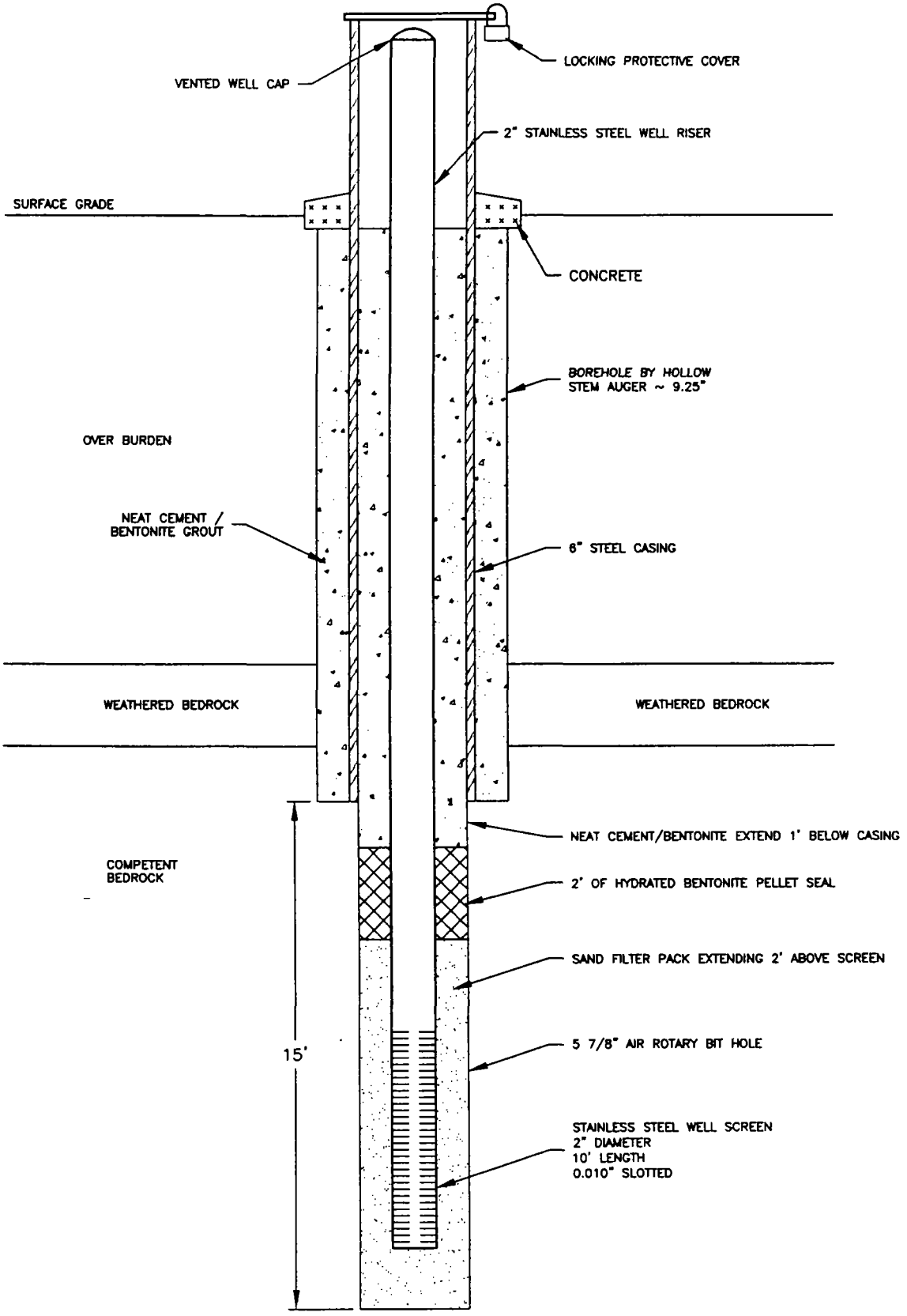
CHECK BY	
DRAWN BY	
DATE	2-2-01
SCALE	AS SHOWN
CAD NO.	6526301H
PRJ NO.	65263.01.

WELL CONSTRUCTION DIAGRAM

THE LOCKFORMER COMPANY
711 OGEDEN AVENUE
LISLE, ILLINOIS

Clayton GROUP SERVICES

FIGURE
5



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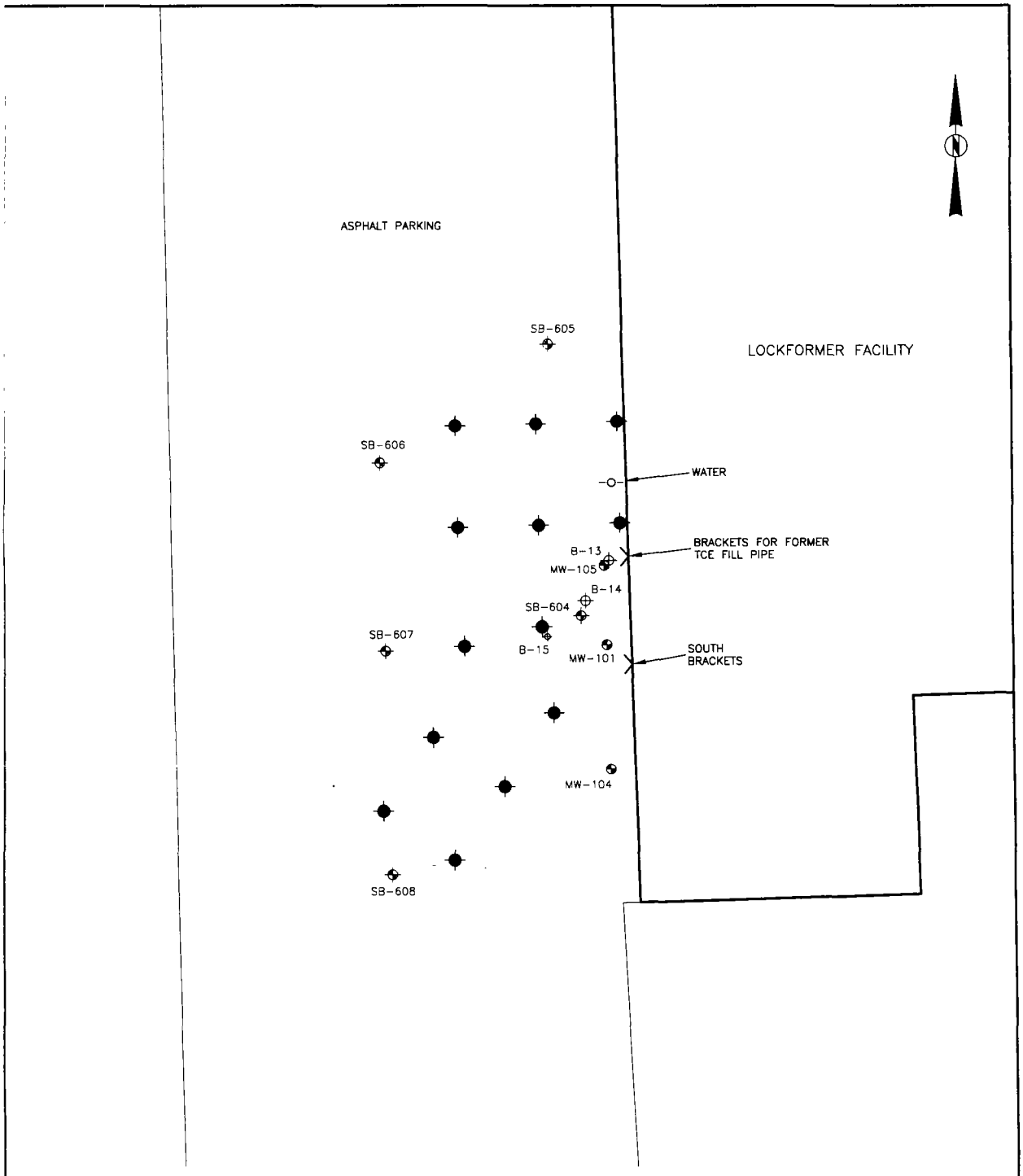
DRAWN BY	
DATE	2-2-01
SCALE	AS SHOWN
CAD NO.	6526301i
PRJ NO.	65263.01

BEDROCK WELL
CONSTRUCTION DIAGRAM

THE LOCKFORMER COMPANY
711 OGDEN AVENUE
LISLE, ILLINOIS

Clayton GROUP SERVICES

FIGURE
6



LEGEND

- PROPOSED SOIL BORING
- MONITORING WELL
- SOIL BORING COMPLETED BY STS (1992 & 1995)
- SOIL BORING COMPLETED BY CEI (8/98, 2/99 AND 12/00)

SCALE IN FEET

0 10 20 40

NOTE: LOCATIONS AT WHICH SOIL SAMPLE ANALYTICAL RESULTS IDENTIFIED TCE CONCENTRATIONS ≥ 25ppm ARE SHOWN IN RED.

CHECK BY	
DRAWN BY	BCF
DATE	3-23-01
SCALE	AS SHOWN
CAD NO.	6526301o
PRJ NO.	65263.01

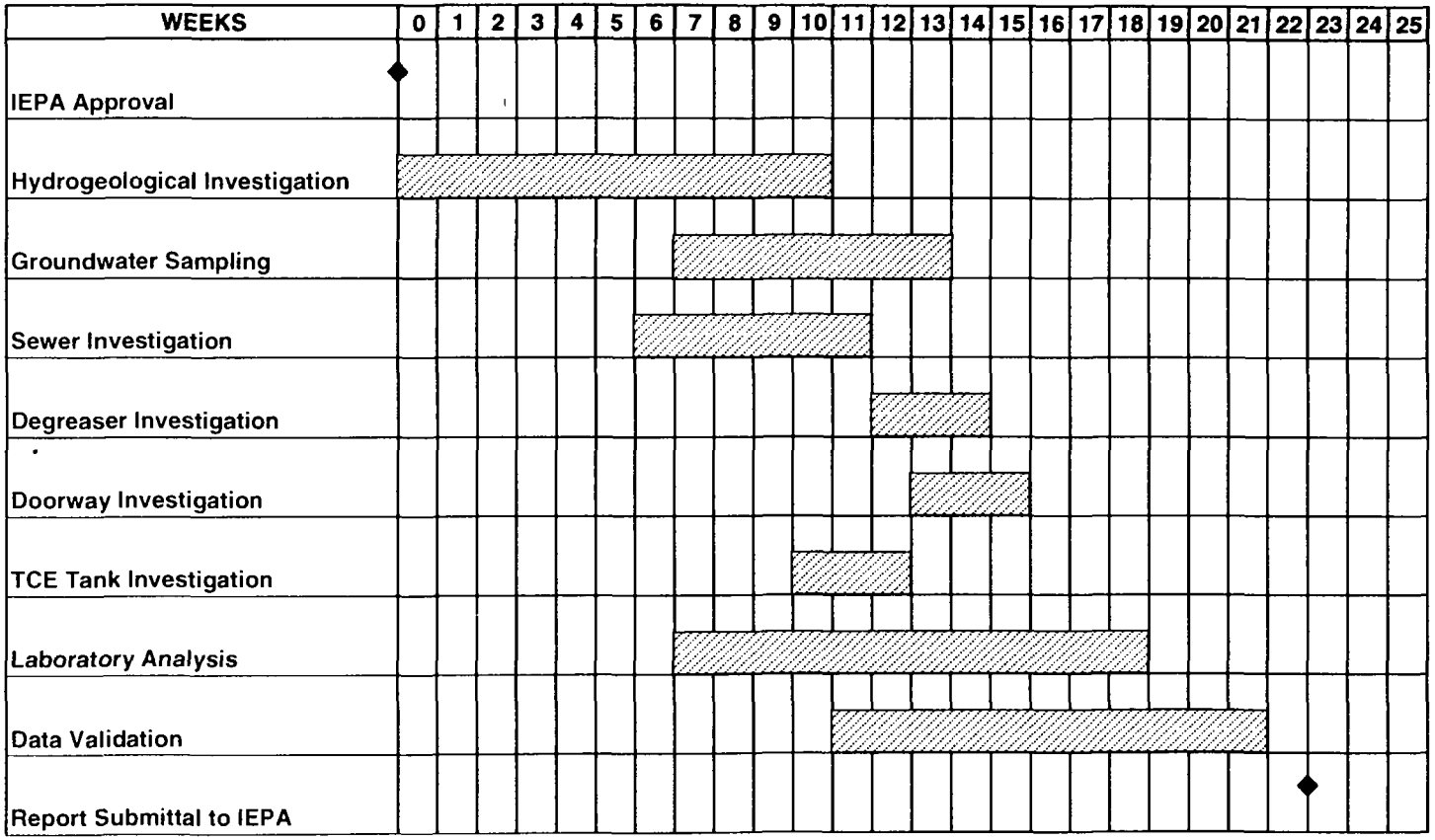
ESTIMATED EXTENT OF TCE CONTAMINATION IN EXCESS OF 25 PPM

THE LOCKFORMER COMPANY
711 OGDEN AVENUE
LISLE, ILLINOIS

Clayton GROUP SERVICES
3140 FINLEY ROAD, DOWNERS GROVE, IL 60515

FIGURE 8

FIGURE 9
Timeline



TABLES

TABLE 1
Analytical Groundwater Summary

Lockformer / Lisle, Illinois

Monitoring Well Locations	Date Sampled	Chemical Parameters Detected above Class I Groundwater Objectives (mg/L)											
		Benzene	Chloroform	1,2-DCE	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Methylene Chloride	PCE	1,1,1-TCA	1,1,2-TCA	TCE	Vinyl Chloride
		0.005 (1)	0.00002 (1)	0.005 (1)	0.007 (1)	0.07 (1)	0.1 (1)	0.005 (1)	0.005 (1)	0.2 (1)	0.005 (1)	0.005 (1)	0.002 (1)
STS Monitoring Wells													
MW-101	Nov-96	0.0046	**0.007**	ND	**0.53**	**38**	**0.49**	**0.063**	**0.0095**	**48**	**0.057**	**68**	**0.073**
MW-101	Aug-98	ND	**0.0036**	**0.025**	**0.5**	**42**	**0.6**	**0.018**	**0.0065**	**3.3**	**0.03**	**54**	**0.048**
MW-101	2/5/1999	ND	ND	ND	**1.1**	**41**	**0.73**	ND	ND	**8.2**	ND	**83**	ND
MW-101	11/15/2000	ND	ND	ND	**0.14**	**7.6**	**0.12**	ND	ND	**1.0**	ND	**17**	ND
MW-120	Nov-96	ND	ND	ND	ND	**0.079**	0.0035	ND	ND	ND	ND	**0.059**	ND
MW-120	Aug-98	ND	ND	ND	ND	**0.072**	ND	**0.0076**	ND	ND	ND	**0.0055**	ND
MW-120	2/15/1999	ND	ND	ND	ND	0.07	0.0037	ND	ND	0.0031	ND	**0.007**	ND
DUP-5 / MW-120	2/15/1999	ND	ND	ND	ND	0.069	0.0036	ND	ND	0.0037	ND	**0.0076**	ND
MW-120	11/15/2000	ND	ND	ND	ND	**0.078**	0.0037	ND	ND	0.0046	ND	**0.01**	ND
MW-123	Nov-96	ND	ND	ND	ND	0.0022	ND	ND	ND	ND	ND	0.0024	ND
MW-123	Aug-98	**0.017**	ND	ND	0.0034	**0.13**	0.0035	0.0033	ND	0.033	ND	**0.43**	ND
MW-123	2/5/1999	ND	ND	ND	ND	0.013	ND	ND	ND	0.0014	ND	**0.027**	ND
MW-123	11/15/2000	ND	ND	ND	ND	0.0042	ND	ND	ND	ND	ND	**0.01**	ND
MW-126	Nov-97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0013	ND
MW-126	Aug-98	ND	ND	ND	ND	ND	ND	0.0049	ND	ND	ND	**0.0063**	ND
MW-126	11/1/1998	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-126	2/19/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-126	11/20/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.001	ND
MW-401	Aug-97	ND	ND	ND	ND	0.034	ND	ND	**0.015**	ND	ND	**0.0072**	ND
MW-401	Aug-98	ND	ND	ND	ND	ND	ND	0.0042	ND	ND	ND	ND	ND
MW-401	2/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-401	11/14/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-402	Aug-97	ND	ND	ND	ND	0.029	0.001	ND	ND	ND	ND	0.0014	ND
MW-402	Aug-98	ND	ND	ND	ND	**0.18**	0.0083	0.0029	ND	ND	ND	**0.0084**	ND
MW-402	2/15/1999	ND	ND	ND	ND	**0.17**	0.0075	ND	ND	ND	ND	**0.03**	ND
MW-402	11/13/2000	ND	ND	ND	ND	**0.29**	0.013	ND	ND	ND	ND	**0.0096**	ND
MW-403	Aug-97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-403	Aug-98	ND	ND	ND	ND	ND	ND	0.0046	ND	ND	ND	ND	ND
MW-403	2/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-403	11/15/2000	Buried-unable to sample											
MW-104	Apr-95	Dry											
MW-104	Aug-98	Dry											
MW-104	2/10/1999	Dry											
MW-104	11/15/2000	Dry											

TABLE 1
Analytical Groundwater Summary

Lockformer / Lisle, Illinois

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		0.005 (1)	0.00002 (1)	0.005 (1)	0.007 (1)	0.07 (1)	0.1 (1)	0.005 (1)	0.005 (1)	0.2 (1)	0.005 (1)	0.005 (1)	0.002 (1)
MW-105	Apr-95	Dry											
MW-105	Aug-98	Dry											
MW-105	2/10/1999	Dry											
MW-105	11/15/2000	Dry											
CEI Monitoring Wells													
MW-500S	Aug-98	Dry											
MW-500S	2/10/1999	Dry											
MW-500S	11/14/2000	Dry											
MW-500D	2/15/1999	ND	ND	ND	ND	**2.9**	0.067	ND	ND	ND	ND	**1.7**	ND
MW-500D	11/14/2000	ND	ND	ND	ND	**4.8**	0.071	ND	ND	ND	ND	**2.1**	ND
MW-501S	Aug-98	Dry											
MW-501S	2/10/1999	Purged 11 gals-no recharge											
MW-501S	11/14/2000	Purged 12 gals-no recharge											
MW-501D	2/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0014	ND
MW-501D	11/14/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0025	ND
MW-502S	Sep-98	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-502S	2/5/1999	ND	ND	ND	ND	0.001	ND	ND	ND	ND	ND	ND	ND
MW-502S	11/14/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-503S	Aug-98	Dry											
MW-503S	2/10/1999	Dry											
MW-503S	11/14/2000	Buried											
MW-504S	Aug-98	Dry											
MW-504S	2/10/1999	Dry											
MW-504S	11/22/2000	Dry											
MW-504D	2/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-504D	11/22/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-505S	Aug-98	Dry											
MW-505S	2/10/1999	Dry											
MW-505S	11/14/2000	Dry											
MW-506S	Aug-98	Dry											
MW-506S	2/10/1999	Dry											
MW-506S	11/14/2000	Dry											
MW-507S	Aug-98	Dry											
MW-507S	2/10/1999	Dry											
MW-507S	11/14/2000	Dry											

TABLE 1
Analytical Groundwater Summary

Lockformer / Lisle, Illinois

Monitoring Well Locations	Date Sampled	Chemical Parameters Detected above Class I Groundwater Objectives (mg/L)											
		Benzene	Chloroform	1,2-DCE	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Methylene Chloride	PCE	1,1,1-TCA	1,2-TCA	TCE	Vinyl Chloride
		0.005 (1)	0.00002 (1)	0.005 (1)	0.007 (1)	0.07 (1)	0.1 (1)	0.005 (1)	0.005 (1)	0.2 (1)	0.005 (1)	0.005 (1)	0.002 (1)
MW-508S	Aug-98	Dry											
MW-508S	2/10/1999	Dry											
MW-508S	11/14/2000	Dry											
MW-508D	2/20/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DUP-6 / MW-508D	2/20/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-508D	11/14/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-513D	2/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-513D	11/13/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-514D	2/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.001	ND
MW-514D	11/15/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-515D	2/17/1999	ND	ND	ND	ND	**0.32**	0.0073	ND	ND	ND	ND	**0.0079**	ND
MW-515D	11/13/2000	ND	ND	ND	ND	**0.44**	0.0088	ND	ND	ND	ND	ND	ND
MW-516D	2/15/1999	ND	ND	ND	ND	**0.099**	0.0029	ND	ND	ND	ND	**0.21**	ND
MW-516D	11/14/2000	ND	ND	ND	ND	**0.15**	0.0038	ND	ND	ND	ND	**0.19**	ND
MW-517D	2/15/1999	ND	ND	ND	ND	**0.15**	0.0063	ND	ND	ND	ND	0.0041	ND
MW-517D	11/14/2000	ND	ND	ND	ND	**0.18**	0.007	ND	ND	ND	ND	**0.0078**	ND
MW-518D (off-site)	12/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-519D (off-site)	12/7/1999	ND	ND	ND	ND	0.018	0.0011	ND	ND	ND	ND	**0.053**	ND
MW-520	11/20/2000	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	ND	0.0047	ND
MW-521	11/20/2000	ND	ND	ND	ND	0.0041	ND	ND	ND	ND	ND	**0.0051**	ND
MW-522	11/20/2000	ND	ND	ND	ND	0.0021	ND	ND	ND	ND	ND	0.0026	ND

NOTES:
(1) - Tiered Approach to Corrective Action Objectives (TACO):(35 IAC, Part 742)-Appendix B: Table E: Tier 1 Ground Water Remediation Objectives (Class I listed).
ND - Not detected
NE - Not established
Bold and double underlined indicates concentration is above Class I remediation objectives.
Only those compounds detected above corresponding objectives are listed on this table.
mg/L: milligram per liter; parts per million (ppm)

APPENDIX A

AGREED ORDER FOR IMMEDIATE AND PRELIMINARY INJUNCTION WITH DEFENDANT LOCKFORMER

provided by J. Doyle 1/22/01

IN THE CIRCUIT COURT FOR EIGHTEENTH JUDICIAL DISTRICT
DuPAGE COUNTY, ILLINOIS
CHANCERY DIVISION

PEOPLE OF THE STATE OF ILLINOIS, *ex rel.* JAMES E. RYAN, Attorney General of the State Illinois, and ex rel. JOSEPH E. BIRKETT, State's Attorney for DuPage County, Plaintiff,	)	
v.	)	No. 01 CH 62
THE LOCKFORMER COMPANY, a Division of MET-COIL SYSTEMS CORPORATION, a Delaware Corporation; and HONEYWELL INTERNATIONAL, INC., a Delaware Corporation, Defendants.	)	

AGREED ORDER FOR IMMEDIATE AND PRELIMINARY INJUNCTION WITH DEFENDANT LOCKFORMER

This cause coming before the Court on Plaintiff's Motion for Immediate and Preliminary Injunction, the parties being represented in open court, and the Court being advised in the premises,

NOW, THEREFORE, the Plaintiff having alleged that there exists a substantial danger to the environment or to the health or welfare of persons pursuant to the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/1 *et seq.* (2000), and Lockformer denying responsibility therefore, and the parties having agreed to the entry of this Preliminary Injunction, the Court enters the following Preliminary Injunction which shall remain in effect until further order by this Court:

1. Finding Defendant Lockformer is a division of Met-Coil Systems Corporation, a Delaware Corporation, which owns and operates a facility located at 711 West Ogden Avenue, Lisle, County of DuPage, Illinois ("Facility" or "Site").

2. Finding Defendant Honeywell International Inc. ("Honeywell") f/k/a AlliedSignal (Allied"), is and was a Delaware corporation. Honeywell f/k/a Allied supplied Lockformer with trichloroethylene ("TCE") for use as a degreaser in connection with metal fabrication processes at Lockformer's Facility.

3. Finding Plaintiff alleges that Defendants, by their actions, have created circumstances of substantial danger to the environment or to the public health or welfare, in direct contravention of the requirements of the Act and the Board Regulations. Plaintiff alleges that Defendants have caused, threatened, or allowed TCE contamination in the vicinity of the Facility, which is the source of TCE contamination found in nearby drinking water wells. Defendant Lockformer denies responsibility for the TCE contamination found in the nearby drinking water wells.

4. Finding nothing contained herein shall be deemed as an admission of any wrongful conduct or violation of any applicable statute, law or regulations thereunder by Defendants nor a finding of fact or adjudication by this Court of any of the facts or claims contained in the Complaint.

5. Finding that Lockformer has retained a professional engineer and a professional geologist, licensed in the State of Illinois and approved by the State, to conduct a Comprehensive Volatile Organic Compounds ("VOC") Investigation to investigate and delineate the nature and extent of the contamination caused by the TCE spills at the Site.

The Court Hereby Orders that:

6. Effective January 19, 2001, Lockformer shall provide potable bottled water, or reimburse all reasonable costs for alternative

drinking water, to all residences not on public water supply located on the north and south sides of Front Street, Reidy Road, Hitchcock Avenue, and Gamble Drive. This area will be bound to the west by Kingston Avenue and will include any homes on the east side of Kingston Avenue and bounded to the east by Westview Lane including any homes on the east side of Westview Lane. Water provisions or reimbursement shall continue until such further order of the court or written agreement by the parties.

7. Within five (5) days of the entry of this Agreed Order, Lockformer shall disclose or make available to Plaintiff any and all information in its possession relating to other potential or actual sources of VOC and/or TCE in the private wells in the vicinity of the Lockformer Site.

8. Within seven (7) days of the date of entry of this Agreed Order, Lockformer shall disclose all usage of VOC other than TCE at the Lockformer Facility from 1990 to the present date, in their possession. Lockformer shall also provide a list of hazardous waste manifests for disposal of spent or waste solvents from 1990 to the present date, in their possession. Lockformer shall provide detailed engineering data on the design of the degreaser and concrete vault in their possession.

9. All submittals and correspondence required by this Order shall be directed to the following persons:

Mr. Donald Gimbel
Illinois Environmental Protection Agency
9511 West Harrison St.
Des Plaines, IL 60016
FAX 847-294-4058

Mr. Stanley Komperda (6 copies)
Illinois EPA #24
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

Ms. Kendra Pohn
Assistant Attorney General
Environmental Bureau
188 West Randolph Street, 20th Floor
Chicago, IL 60601
FAX 312-814-2347

Mr. Howard O. Chinn
Chief Engineer
Environmental Bureau
188 West Randolph Street, 20th Floor
Chicago, IL 60601
FAX 312-814-2347

Ms. Deborah Smith
Assistant State's Attorney for DuPage County
505 North County Farm Road
Wheaton, Illinois 60187
FAX 630-682-7048

Mr. Daniel J. Biederman (2 copies)
Chuhak & Tecson
225 West Washington Street, Suite 1300
Chicago, IL 60606-3418
FAX 312-444-9027

10. Within fourteen (14) days of the entry of this Agreed Order, Lockformer shall submit a Comprehensive VOC Investigation Work Plan ("Work Plan") including timetables. The Work Plan shall include, but not be limited to, the installation of eight on and off-site monitoring well clusters. Each well cluster shall consist of a shallow (upper aquifer) and deep (bedrock) monitoring well. The monitoring wells shall assist in determining the rate and flow of groundwater and extent of contamination. The Work Plan shall also include a pump test of the lower aquifer utilizing the on-site production well. Wells screened in the upper and lower aquifer shall be monitored during the pump test for changes in groundwater elevation. One angle hole boring shall be drilled into bedrock and an

assessment of bedrock master point characteristics shall be performed or Lockformer shall suggest an alternative technique, subject to review and approval of the State, to determine bedrock fracture characteristics.

11. Within fourteen (14) days of the State's approval of the Work Plan, Lockformer shall commence the Comprehensive VOC Investigation in accordance with timetables approved therein. Notwithstanding revisions and discussions with the State, if no approval is obtained from the State, the State retains the right to begin the necessary work on or about March 5, 2001, and reserves the right to pursue recovery of any costs of performing such necessary work.

12. Within seven (7) days of completion of the Comprehensive VOC Investigation, Lockformer shall prepare and submit a Comprehensive VOC Investigation Report to the State for review. Review shall determine whether the investigation and report fully determines the nature and extent of the on and off site contamination. The Comprehensive VOC Investigation Report shall include, but not be limited to:

A) Executive summary. This shall identify the objectives of the site investigation and the technical approach utilized to meet such objectives. It shall state whether recognized environmental conditions were identified and the data limitations in the assessment;

B) Site characterization. This shall include the compilation of all sources reviewed and information obtained as a result of the investigation including existing information from previous studies and including but not limited to:

1) Sources consulted or reviewed. This shall contain a list of reference documents used in completing the investigation;

2) Site history. This shall present a chronological summary of the historic uses of the remediation site as prescribed by "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" (ASTM E 1527-94);

3) Area of Impact description and mapping of the soil and groundwater plumes. This shall describe the regional location, pertinent boundary features, general facility physiography, geology, hydrogeology, existing and potential migration pathways and exposure routes, and current and post-remediation uses of the impacted and surrounding areas. Information from the State Geological Survey and private and public well information should be incorporated.

4) Site base maps of sufficient detail and accuracy to show all of the following:

a) A distance of at least 2,000 feet around the impacted area at a scale no smaller than one inch equal to 200 feet;

b) Map scale, north arrow orientation, date, and location of the site with respect to township, range and section;

c) Site boundary lines, with property adjacent to the impacted area clearly indicated, if reasonably identifiable;

d) Surrounding land uses;

e) Sources or potential sources of contaminants of concern, spill areas, and other suspected areas for any or all contaminants of concern;

f) On-site and off-site withdrawal wells including past wells believed to have been abandoned; and

g) All buildings, tanks, piles, utilities, paved areas, easements, right-of-ways and other features, including all known past and current product and waste underground tanks or piping.

5) A legal description or reference to a plat showing the boundaries of the remediation site;

C) Comprehensive sampling plan. This shall indicate those applicable physical and chemical methods utilized for contaminant source investigations, soil and sediment investigations, hydro geological investigations, surface water investigations, and potential receptor investigations;

D) Documentation of field activities. This shall include the results of the field activities to determine physical characteristics. At a minimum, this chapter shall include the following elements:

1) Narrative description of the field activities conducted during the investigation;

2) The quality assurance project plan utilized to document all monitoring procedures performed during the investigation, so as to ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented; and

3) Presentation of the data in an appropriate format such that all the information is organized and presented logically and that the relationships between the different investigations for each medium are apparent.

E) Endangerment Assessment. This shall analyze the results of the field activities and characterize the extent of contamination, quantitative and qualitative, for contaminants of concern and compare the impacted area information with applicable provisions of 35 Ill. Admin. Code 742. This chapter shall:

1) Describe any recognized environmental conditions, evaluate exposure routes, including threatened releases, and evaluate exposure routes excluded under 35 Ill. Admin. Code 742;

2) Describe and map the nature, concentration, and extent of contaminants of concern within all environmental media and assess the observed and potential contaminant fate and transport;

3) Describe the significant physical features of the remediation site and vicinity that may affect contaminant transport risk to human health, safety, and the environment; and

4) Compare the concentrations of the contaminants of concern with the corresponding Tier 1 soil and groundwater remediation objectives under 35 Ill. Admin. Code 742;

F) Conclusion. This shall assess the sufficiency of the data in the report and recommend future steps;

G) Appendices. References and data sources, including but not limited to field logs, well logs, and reports of laboratory analyses, shall be incorporated into the appendices; and

13. Within fourteen (14) days of receipt of the State's written determination that the results of the Comprehensive VOC Investigation Report fully determine the nature and extent of contamination, Lockformer shall develop remediation objectives for remediation of soil, groundwater and surface water contamination, both on Site and

off Site, which is attributable to the Defendants, and submit a Remediation Objectives Report.

14. Within fourteen (14) days of receipt of the State's written approval of the Remediation Objectives Report, Lockformer shall submit to the State a Remedial Action Plan, for remediation of soil, groundwater and surface water contamination, both on Site and off Site, which is attributable to the Defendants. The Remedial Action Plan shall include a timetable for its implementation.

15. The State shall review and comment on the Remedial Action Plan. Lockformer shall make changes, if any, necessitated by such review. Upon written approval by the State of the Remedial Action Plan, Lockformer shall implement it according to its terms, within the time period approved by the State.

16. If the State rejects any of the documents or reports described above, within fourteen (14) days of the receipt of the rejection letter, Lockformer shall submit a modified document to satisfy the State's comments.

17. Within fourteen (14) days of completion of the activities required by the Remedial Action Plan, Lockformer shall submit to the State a Remediation Completion Report that complies with the format of 35 Ill. Adm. Code 740.455. Upon receipt of the Remediation Completion Report, the State shall review and either approve or reject it. The State reserves the right to reject the Remediation Completion Report if Lockformer has failed to implement the Remediation Plan previously approved by the State, or if the remediation objectives established in the approved Remediation Action Plan have not been met.

18. If the State rejects the Remediation Completion Report, Lockformer shall, within fourteen (14) days after receiving such

rejection notification from the State, perform to completion additional corrective action as necessary to satisfy the State's comments.

19. All Site remediation activities shall be conducted by, or under the supervision of, a Licensed Professional Engineer ("LPE") and Licensed Professional Geologist ("LPG") licensed and in good standing in Illinois. All plans and reports submitted by Lockformer for review and evaluation shall be prepared by or under the supervision of an LPE or LPG.

20. Lockformer shall pay all reasonable past costs incurred by the Illinois EPA pursuant to the Review and Evaluation Services Agreement executed by Lockformer and the Illinois EPA on August 18, 1998, in accordance with 35 Ill. Adm. Code Part 740. The State reserves the right to pursue recovery of any other costs of investigation and pursuit of this matter.

21. If Lockformer fails to meet any deadline contained herein or fails to timely provide any information referenced herein, (subject to an extension of time granted by Plaintiff's written determination or granted by Court Order), Lockformer shall pay a stipulated penalty of two thousand dollars ($2,000.00) per day until such time as Lockformer has satisfied the requirement contained herein. Stipulated penalties shall continue to run during the pendency of any dispute resolution process, but shall not attach if Lockformer prevails in dispute resolution. Payment shall be made by certified check or money order, made payable to the Illinois EPA for deposit into the Environmental Protection Trust Fund and shall be sent by first class mail and delivered to:

Illinois Environmental Protection Agency
Fiscal Services
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

22. Any failure by Lockformer to comply with any requirements of this Agreed Order shall not be a violation of this Agreed Order if such failure is the result of action(s) by persons or events beyond the reasonable control of Lockformer including, but not limited to, acts of God, act of public enemy, war, blockade, public riot, fire, flood or labor dispute. Disputes relative to compensation payable to agents, employees, or servants, or increased costs shall not be considered circumstances beyond the control of Lockformer.

23. The parties shall use their best efforts to resolve all disputes or differences of opinion arising with regard to this Agreed Order, informally and in good faith. If however, disputes arise concerning this Agreed Order which the parties are unable to resolve informally, either party may, by written motion, request that an evidentiary hearing be held before the DuPage County Circuit Court, to resolve the dispute between the parties.

24. The parties may, by mutual consent, extend any compliance dates under this Agreed Interim Order without leave of Court. Any such agreed modification shall be in writing, signed by authorized representatives of each party and incorporated into this Agreed Interim Order by reference.

25. Lockformer asserts there has been no spilling at the Site for a number of years. Nonetheless, Lockformer shall cease and desist from causing or allowing any spilling of TCE at the Facility.

26. In addition to any other authority, the Illinois EPA, its employees and representatives and the Attorney General, his agents and

representatives, and the DuPage County State's Attorney, his agents and representatives, shall have the right of entry into and upon Lockformer facility which is the subject of this Agreed Order, at all reasonable times for the purposes of carrying out inspections. Plaintiff agrees to comply with the safety regulations in effect at the Facility at the time of inspection. In conducting such inspections, the Illinois EPA, its employees and representatives, and the Attorney General, his employees and representatives, and the DuPage County State's Attorney, his agents and representatives, may take photographs, samples, and collect information, as they deem necessary. Plaintiff shall provide upon Defendant's request duplicate photos, if any photos are taken in the course of inspection. For any photographs taken or information collected during said inspections, Lockformer may make whatever claims as are allowed under Section 7 of the Act, 415 ILCS 5/7 (2000) or the Illinois EPA regulations regarding access to Illinois EPA records at 2 Ill. Adm. Code 1828.

27. This Agreed Order for Immediate and Preliminary Injunction is not a final resolution on the merits of the Plaintiff's Complaint filed herein, but rather addresses the Plaintiff's immediate concerns regarding the releases alleged in the Complaint.

28. THIS MATTER is set for further status on _____, 2001.

ENTERED: _____
JUDGE

DATED: _____

AGREED:
For Defendant
THE JOCKFORMER COMPANY

BY: _____

TITLE: _____

For Illinois Attorney General

BY: _____
ROSEMARIE CAZEAU, Chief
Environmental Bureau

For the Illinois EPA

BY: _____
JOSEPH E. SVOBODA,
Chief Legal Counsel

For DuPage County State's Attorney
JOSEPH E. BIRKETT
State's Attorney
DuPage County, Illinois

BY: _____
JOSEPH E. BIRKETT
DuPage County State's Attorney
505 North County Farm Road
Wheaton, Illinois 60187

Of Counsel:

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Assistant State's Attorney, DuPage County
505 North County Farm Rd.
Wheaton, IL 60187
(630) 682-7056

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28. THIS MATTER is set for further status on _____, 2001.

ENTERED

ENTERED: _____
JUDGE JAN 22 2001

DATED: _____
ROBERT E. BYRNE, JUDGE

AGREED:
For Defendant
THE LOCKFORMER COMPANY

BY: _____

TITLE: _____

For Illinois Attorney General

BY: _____
ROSEMARIE CAZEAU, Chief
Environmental Bureau

For the Illinois EPA

BY: _____
JOSEPH E. SVOBODA,
Chief Legal Counsel

For DuPage County State's Attorney
JOSEPH E. BIRKETT
State's Attorney
DuPage County, Illinois

BY: _____
JOSEPH E. BIRKETT
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